

SPECIFICATION

Electronic Version 1.2.8

Stylesheet Version 1.0

COATED CHEWING GUM PRODUCTS AND METHODS FOR MAKING SAME

Background of the Invention

- [0001] The present invention relates generally to confectionery products. More specifically, the present invention relates to coated chewing gum products and methods of making same.
- [0002] It is, of course, known to make a variety of confectionery products. One such confectionery product is chewing gum. Confectionery products have been molded, extruded, or otherwise shaped into various forms over the years. For example, chewing gum has been formed into shapes such as flat sticks, cylinders, cubes, cigars, shredded chew, and the like. An example of a traditional shape for chewing gum is the gumball. Providing a confectionery product such as chewing gum in novel shapes or forms can lead to enhanced marketability of such product, particularly with younger consumers.
- [0003] In addition to providing a variety of shapes and forms for chewing gum products, a considerable amount of developmental activities have involved improving the flavor release characteristics of chewing gum. One desired outcome is to prolong the release of flavor during the chew.
- [0004] Not only is it desirable to extend flavor release, a further desired result is to increase the flavor perception. Increasing flavor perception to the consumer provides a more enjoyable chew. Additionally, increasing the level of flavor can also provide breath-freshening characteristics to the product.

- [0005] As noted above, gumballs are well known in the confectionery industry as well as to consumers. Gumballs can comprise a chewing gum center that is coated with a hard shell. A product that is related to traditional gum balls are miniature coated pellets. Examples of such products are Chiclets and Mini-Chiclets. Such products have been sold for a number of years. However, a disadvantage of these miniature type chewing gum products is they tend to lose their flavor quickly during the chew. Further, at least some of these products do not provide the consumer with much flavor during the chew.
- [0006] A number of attempts have been made at producing chewing gum having longer-lasting flavor and/or increased flavor perception. The inventors believe these attempts have not been entirely successful, at least with respect to coated chewing gum products that have a reduced size.
- [0007] There is therefore a need for improved compositions and methods for providing coated chewing gum products and specifically, miniature chewing gum products, having improved flavor release and perception characteristics.

Summary of the Invention

- [0008] The present invention provides improved coated chewing gum products as well as methods of making same. In this regard, the present invention provides coated chewing gum products that have an extended flavor release as well as increased flavor perception that can, in an embodiment, provide breath freshening characteristics. This is true even if the products are provided in a small or reduced size.
- [0009] To this end, the present invention provides a coated chewing gum product. The product comprises a gum center that includes a water-soluble portion and a water-insoluble portion. The water-insoluble portion comprises at least 50% by weight of the gum center. The gum center includes less than 5% by weight of bulk sweeteners. A coating substantially surrounds the gum center.
- [0010] In an embodiment, the coating comprises at least 50% by weight of the coated chewing gum product.

- [0011] In an embodiment, the coating comprises at least 80% by weight of the coated chewing gum product.
- [0012] In an embodiment, the gum center does not include any bulk sweeteners.
- [0013] In an embodiment, the insoluble portion comprises at least 65% by weight of the gum center.
- [0014] In an embodiment, the product has a spherical shape.
- [0015] In an embodiment, the product has a pellet shape.
- [0016] In an embodiment, the gum center includes 0.1 to 25% by weight flavor.
- [0017] In an embodiment, the gum center is wax-free.
- [0018] In an embodiment, the coating includes: at least 0.1% to about 12% flavoring; at least 0.05% to about 1.0% by weight artificial sweetener; and at least 0.1% to about 5% by weight dispensing agent.
- [0019] In a further embodiment of the present invention, a coated chewing gum product is provided. The product comprises a gum center including a water soluble portion and a water insoluble portion, the water insoluble portion comprising at least 50% by weight of the gum center. The gum center includes a flavoring agent that comprises at least 0.1% by weight of the gum center and less than 5% by weight of a bulk sweetener. A coating substantially surrounds the gum center and comprises at least 50% by weight of the coated chewing gum product.
- [0020] In yet another embodiment of the present invention, a method of improving flavor perception in a coated chewing gum product is provided. The method comprising the steps of providing a coated chewing gum product that includes a gum center that comprises at least 50% by weight gum base and less than 5% bulk sweeteners.
- [0021] An advantage of the present invention is to provide an improved chewing gum product.
- [0022] Additionally, an advantage of the present invention is to provide an improved

method for making chewing gum products.

[0023] Still further, an advantage of the present invention is to provide a coated chewing gum product having increased flavor release characteristics.

[0024] Moreover, an advantage of the present invention is to provide a chewing gum product that has enhanced flavor perception.

[0025] Further, an advantage of the present invention is to provide a chewing gum product that provides improved breath freshening characteristics.

[0026] Furthermore, an advantage of the present invention is to provide a coated chewing gum product having reduced size but having improved flavor release characteristics.

[0027] Another advantage of the present invention is to provide an improved method for making coated chewing gum products having a reduced size.

[0028] Moreover, an advantage of the present invention is to provide an improved coated chewing gum product.

[0029] Additional features and advantages of the present invention will be described in and apparent from the detailed description of the presently preferred embodiments.

Detailed Description

[0030] The present invention provides improved chewing gum products as well as methods of manufacturing same. In the preferred embodiment set forth below, the present invention provides improved coated chewing gum products as well as methods of making same. The products have improved flavor release characteristics. Additionally, the products are designed to provide improved flavor perception as compared to similar type products. In an embodiment, this provides an improved breath freshening product.

[0031] The inventors have surprisingly discovered that by producing a gum composition that has a high level of base and little or no bulk sweetener a product is produced that has improved flavor perception during the chew. Such a product is especially advantageous for use with gumballs and reduced sized chewing products, especially

DRAFT 10/2020

coated products. Due to the small size of some reduced products, consumers are able to reload or add more products in their mouth as they chew the initial pieces. This offers a consumer the opportunity to control cud size, flavor, and/or freshness enhancement during the time period they chew.

[0032] In general, chewing gum compositions typically comprises a water-soluble portion and a water insoluble portion. The water insoluble portion is referred to as gum base.

[0033] The water insoluble gum base may typically contain any combination of elastomers, resins, fats and oils, softeners, and inorganic fillers. The gum base may or may not include wax. The insoluble gum base may constitute approximately 50 to about 95% by weight of the chewing gum, in an embodiment the gum base comprises 65 to about 75% by weight of the chewing gum.

[0034] Elastomer plasticizers that are used in the gum base may include, but are not limited to, natural rosin esters such as glycerol esters of partially hydrogenated rosin, glycerol esters of polymerized rosin, glycerol esters of partially dimerized rosin, glycerol esters of rosin, pentaerythritol esters of rosin, synthetics such as terpene resins derived from alpha-pinene, beta-pinene, and/or d-limonene, and any suitable combinations of the foregoing. The preferred elastomer plasticizers will vary depending on the specific application, and on the type elastomer which is used.

[0035] Fillers/texturizers that are used in the gum base may include magnesium and calcium carbonate, ground limestone, silicate types such as magnesium and aluminum silicate, clay, alumina, talc, titanium oxide, mono-, di-, and tri-calcium phosphate, cellulose polymers, such as wood, and combinations thereof.

[0036] Softeners/emulsifiers that are used in the gum base may include tallow, hydrogenated tallow, hydrogenated and partially hydrogenated vegetable oils, cocoa butter, glycerol monostearate, glycerol triacetate, lecithin, mono-, di- and triglycerides, acetylated monoglycerides, fatty acids (e.g., stearic, palmitic, oleic, and linoleic acids), and combinations thereof. Colorants and whiteners may include FD&C type dyes and lakes, fruit and vegetable extracts, titanium dioxide, and combinations thereof.

[0037] As noted above, the base may or may not include wax. An example of a wax-free gum base is disclosed in US Patent No. 5,286,500, the disclosure which is incorporated herein by reference.

[0038] Pursuant to the present invention the chewing gum contains little or no bulk sweeteners. Bulk sweeteners of the present invention comprise less than 5% by weight of the chewing gum center. In an embodiment, the chewing gum does not include any bulk sweeteners.

[0039] High intensity sweeteners may also be present in the chewing gum. When used, high intensity sweeteners may constitute between approximately 0.01% to about 5% and in an embodiment, approximately 0.015 to about 3% by weight of the chewing gum center. Such sweeteners may include, but are not limited to, aspartame, salts of acesulfame, alitame, saccharin and its salts, neotame, sucralose, cyclamic acid and its salts, glycyrrhizin, dihydrochalcones, thaumatin, monellin, and the like, alone or in any combination.

[0040] Flavor should generally be present in the chewing gum in an amount within the range of approximately 0.1% to about 25% by weight of chewing gum, in an embodiment, approximately 3% to about 20%, and in a further embodiment, approximately 5% to about 15% by weight of the chewing gum. Flavoring agents may include essential oils, synthetic flavors or mixtures thereof including, but not limited to, oils derived from plants and fruits such as citrus oils, fruit oils, clove oil, oil of wintergreen, anise, menthol, and the like. Artificial flavoring agents and components may also be used in the flavor ingredient of the invention. Natural and artificial flavoring agents may be combined in any sensorially acceptable fashion.

[0041] Optional ingredients such as colors, emulsifiers, pharmaceutical agents and additional flavoring agents may also be included in the chewing gum.

[0042] In a preferred embodiment, the present invention provides a coated chewing gum product. The coating for the present invention may comprise approximately 50 to about 95% by weight of the entire coated product. In an embodiment approximately 80 to about 90% by weight of the gum product is coating. Sugar or sugarless

PCT/US2016/032604

sweeteners may also be used in the coating composition.

[0043] In a preferred embodiment, the present invention is utilized to produce a chewing gum product that is formed into miniature sized balls. The miniature sized balls are coated to provide a hard, surrounding shell. U.S. Patent No. 5,667,824, the disclosure of which is incorporated herein by reference, discloses both methods and apparatus for configuring miniature, round gumballs. Other alternative processes, such as extrusion, cutting and tumbling, may be employed by those skilled in the art to produce round (spherical) centers. Of course, if desired, any shaped product can be produced. For example, in an embodiment, pellet shaped products are produced.

[0044] Once the gum center has been made and formed, the gum center is coated. The gum center can be coated or panned by conventional panning techniques to make a coated miniature ball gum. The bulk sweetener in the coating is very stable and highly water soluble, and can be easily added to a solution prepared for panning. The bulk sweetener may be combined with sucrose, other polyols, or used alone in solution as the coating on the gum center. Further, the bulk sweetener can also be added as a powder blended with other powders often used in some types of conventional panning procedures.

[0045] Conventional panning procedures generally use sucrose to coat. Recent advances in panning have allowed the use of other carbohydrate materials to be used in the place of sucrose for the coating. Some of these components include, but are not limited to, dextrose, maltose, zylitol, hydrogenated isomaltulose and other new polyols or combinations thereof. These materials may be blended with panning modifiers including, but not limited to, gum arabic, maltodextrins, corn syrup, gelatin, cellulose type materials like carboxymethyl cellulose, starch and modified starches, vegetable gums like alginates, locust bean gum, guar gum and talc. Antitack agents may also be added as panning modifiers, which allow the use of a variety of carbohydrates and sugar alcohols to be used in the development of new panned or coated gum products.

[0046] The coating that is used to produce the coated gum product may contain ingredients such as flavoring agents, artificial sweeteners, dispersing agents, coloring

P0044 P0045 P0046 P0047 P0048 P0049 P0050 P0051 P0052 P0053 P0054 P0055 P0056 P0057 P0058 P0059 P0060 P0061 P0062 P0063 P0064 P0065 P0066 P0067 P0068 P0069 P0070 P0071 P0072 P0073 P0074 P0075 P0076 P0077 P0078 P0079 P0080 P0081 P0082 P0083 P0084 P0085 P0086 P0087 P0088 P0089 P0090 P0091 P0092 P0093 P0094 P0095 P0096 P0097 P0098 P0099 P00100 P00101 P00102 P00103 P00104 P00105 P00106 P00107 P00108 P00109 P00110 P00111 P00112 P00113 P00114 P00115 P00116 P00117 P00118 P00119 P00120 P00121 P00122 P00123 P00124 P00125 P00126 P00127 P00128 P00129 P00130 P00131 P00132 P00133 P00134 P00135 P00136 P00137 P00138 P00139 P00140 P00141 P00142 P00143 P00144 P00145 P00146 P00147 P00148 P00149 P00150 P00151 P00152 P00153 P00154 P00155 P00156 P00157 P00158 P00159 P00160 P00161 P00162 P00163 P00164 P00165 P00166 P00167 P00168 P00169 P00170 P00171 P00172 P00173 P00174 P00175 P00176 P00177 P00178 P00179 P00180 P00181 P00182 P00183 P00184 P00185 P00186 P00187 P00188 P00189 P00190 P00191 P00192 P00193 P00194 P00195 P00196 P00197 P00198 P00199 P00200 P00201 P00202 P00203 P00204 P00205 P00206 P00207 P00208 P00209 P00210 P00211 P00212 P00213 P00214 P00215 P00216 P00217 P00218 P00219 P00220 P00221 P00222 P00223 P00224 P00225 P00226 P00227 P00228 P00229 P00230 P00231 P00232 P00233 P00234 P00235 P00236 P00237 P00238 P00239 P00240 P00241 P00242 P00243 P00244 P00245 P00246 P00247 P00248 P00249 P00250 P00251 P00252 P00253 P00254 P00255 P00256 P00257 P00258 P00259 P00260 P00261 P00262 P00263 P00264 P00265 P00266 P00267 P00268 P00269 P00270 P00271 P00272 P00273 P00274 P00275 P00276 P00277 P00278 P00279 P00280 P00281 P00282 P00283 P00284 P00285 P00286 P00287 P00288 P00289 P00290 P00291 P00292 P00293 P00294 P00295 P00296 P00297 P00298 P00299 P00300 P00301 P00302 P00303 P00304 P00305 P00306 P00307 P00308 P00309 P00310 P00311 P00312 P00313 P00314 P00315 P00316 P00317 P00318 P00319 P00320 P00321 P00322 P00323 P00324 P00325 P00326 P00327 P00328 P00329 P00330 P00331 P00332 P00333 P00334 P00335 P00336 P00337 P00338 P00339 P00340 P00341 P00342 P00343 P00344 P00345 P00346 P00347 P00348 P00349 P00350 P00351 P00352 P00353 P00354 P00355 P00356 P00357 P00358 P00359 P00360 P00361 P00362 P00363 P00364 P00365 P00366 P00367 P00368 P00369 P00370 P00371 P00372 P00373 P00374 P00375 P00376 P00377 P00378 P00379 P00380 P00381 P00382 P00383 P00384 P00385 P00386 P00387 P00388 P00389 P00390 P00391 P00392 P00393 P00394 P00395 P00396 P00397 P00398 P00399 P00400 P00401 P00402 P00403 P00404 P00405 P00406 P00407 P00408 P00409 P00410 P00411 P00412 P00413 P00414 P00415 P00416 P00417 P00418 P00419 P00420 P00421 P00422 P00423 P00424 P00425 P00426 P00427 P00428 P00429 P00430 P00431 P00432 P00433 P00434 P00435 P00436 P00437 P00438 P00439 P00440 P00441 P00442 P00443 P00444 P00445 P00446 P00447 P00448 P00449 P00450 P00451 P00452 P00453 P00454 P00455 P00456 P00457 P00458 P00459 P00460 P00461 P00462 P00463 P00464 P00465 P00466 P00467 P00468 P00469 P00470 P00471 P00472 P00473 P00474 P00475 P00476 P00477 P00478 P00479 P00480 P00481 P00482 P00483 P00484 P00485 P00486 P00487 P00488 P00489 P00490 P00491 P00492 P00493 P00494 P00495 P00496 P00497 P00498 P00499 P00500 P00501 P00502 P00503 P00504 P00505 P00506 P00507 P00508 P00509 P00510 P00511 P00512 P00513 P00514 P00515 P00516 P00517 P00518 P00519 P00520 P00521 P00522 P00523 P00524 P00525 P00526 P00527 P00528 P00529 P00530 P00531 P00532 P00533 P00534 P00535 P00536 P00537 P00538 P00539 P00540 P00541 P00542 P00543 P00544 P00545 P00546 P00547 P00548 P00549 P00550 P00551 P00552 P00553 P00554 P00555 P00556 P00557 P00558 P00559 P00560 P00561 P00562 P00563 P00564 P00565 P00566 P00567 P00568 P00569 P00570 P00571 P00572 P00573 P00574 P00575 P00576 P00577 P00578 P00579 P00580 P00581 P00582 P00583 P00584 P00585 P00586 P00587 P00588 P00589 P00590 P00591 P00592 P00593 P00594 P00595 P00596 P00597 P00598 P00599 P00600 P00601 P00602 P00603 P00604 P00605 P00606 P00607 P00608 P00609 P00610 P00611 P00612 P00613 P00614 P00615 P00616 P00617 P00618 P00619 P00620 P00621 P00622 P00623 P00624 P00625 P00626 P00627 P00628 P00629 P00630 P00631 P00632 P00633 P00634 P00635 P00636 P00637 P00638 P00639 P00640 P00641 P00642 P00643 P00644 P00645 P00646 P00647 P00648 P00649 P00650 P00651 P00652 P00653 P00654 P00655 P00656 P00657 P00658 P00659 P00660 P00661 P00662 P00663 P00664 P00665 P00666 P00667 P00668 P00669 P00670 P00671 P00672 P00673 P00674 P00675 P00676 P00677 P00678 P00679 P00680 P00681 P00682 P00683 P00684 P00685 P00686 P00687 P00688 P00689 P00690 P00691 P00692 P00693 P00694 P00695 P00696 P00697 P00698 P00699 P00700 P00701 P00702 P00703 P00704 P00705 P00706 P00707 P00708 P00709 P00710 P00711 P00712 P00713 P00714 P00715 P00716 P00717 P00718 P00719 P00720 P00721 P00722 P00723 P00724 P00725 P00726 P00727 P00728 P00729 P00730 P00731 P00732 P00733 P00734 P00735 P00736 P00737 P00738 P00739 P00740 P00741 P00742 P00743 P00744 P00745 P00746 P00747 P00748 P00749 P00750 P00751 P00752 P00753 P00754 P00755 P00756 P00757 P00758 P00759 P00760 P00761 P00762 P00763 P00764 P00765 P00766 P00767 P00768 P00769 P00770 P00771 P00772 P00773 P00774 P00775 P00776 P00777 P00778 P00779 P00780 P00781 P00782 P00783 P00784 P00785 P00786 P00787 P00788 P00789 P00790 P00791 P00792 P00793 P00794 P00795 P00796 P00797 P00798 P00799 P00800 P00801 P00802 P00803 P00804 P00805 P00806 P00807 P00808 P00809 P00810 P00811 P00812 P00813 P00814 P00815 P00816 P00817 P00818 P00819 P00820 P00821 P00822 P00823 P00824 P00825 P00826 P00827 P00828 P00829 P00830 P00831 P00832 P00833 P00834 P00835 P00836 P00837 P00838 P00839 P00840 P00841 P00842 P00843 P00844 P00845 P00846 P00847 P00848 P00849 P00850 P00851 P00852 P00853 P00854 P00855 P00856 P00857 P00858 P00859 P00860 P00861 P00862 P00863 P00864 P00865 P00866 P00867 P00868 P00869 P00870 P00871 P00872 P00873 P00874 P00875 P00876 P00877 P00878 P00879 P00880 P00881 P00882 P00883 P00884 P00885 P00886 P00887 P00888 P00889 P00890 P00891 P00892 P00893 P00894 P00895 P00896 P00897 P00898 P00899 P00900 P00901 P00902 P00903 P00904 P00905 P00906 P00907 P00908 P00909 P00910 P00911 P00912 P00913 P00914 P00915 P00916 P00917 P00918 P00919 P00920 P00921 P00922 P00923 P00924 P00925 P00926 P00927 P00928 P00929 P00930 P00931 P00932 P00933 P00934 P00935 P00936 P00937 P00938 P00939 P00940 P00941 P00942 P00943 P00944 P00945 P00946 P00947 P00948 P00949 P00950 P00951 P00952 P00953 P00954 P00955 P00956 P00957 P00958 P00959 P00960 P00961 P00962 P00963 P00964 P00965 P00966 P00967 P00968 P00969 P00970 P00971 P00972 P00973 P00974 P00975 P00976 P00977 P00978 P00979 P00980 P00981 P00982 P00983 P00984 P00985 P00986 P00987 P00988 P00989 P00990 P00991 P00992 P00993 P00994 P00995 P00996 P00997 P00998 P00999 P001000 P001001 P001002 P001003 P001004 P001005 P001006 P001007 P001008 P001009 P001010 P001011 P001012 P001013 P001014 P001015 P001016 P001017 P001018 P001019 P001020 P001021 P001022 P001023 P001024 P001025 P001026 P001027 P001028 P001029 P001030 P001031 P001032 P001033 P001034 P001035 P001036 P001037 P001038 P001039 P001040 P001041 P001042 P001043 P001044 P001045 P001046 P001047 P001048 P001049 P001050 P001051 P001052 P001053 P001054 P001055 P001056 P001057 P001058 P001059 P001060 P001061 P001062 P001063 P001064 P001065 P001066 P001067 P001068 P001069 P001070 P001071 P001072 P001073 P001074 P001075 P001076 P001077 P001078 P001079 P001080 P001081 P001082 P001083 P001084 P001085 P001086 P001087 P001088 P001089 P001090 P001091 P001092 P001093 P001094 P001095 P001096 P001097 P001098 P001099 P001100 P001101 P001102 P001103 P001104 P001105 P001106 P001107 P001108 P001109 P001110 P001111 P001112 P001113 P001114 P001115 P001116 P001117 P001118 P001119 P001120 P001121 P001122 P001123 P001124 P001125 P001126 P001127 P001128 P001129 P001130 P001131 P001132 P001133 P001134 P001135 P001136 P001137 P001138 P001139 P001140 P001141 P001142 P001143 P001144 P001145 P001146 P001147 P001148 P001149 P001150 P001151 P001152 P001153 P001154 P001155 P001156 P001157 P001158 P001159 P001160 P001161 P001162 P001163 P001164 P001165 P001166 P001167 P001168 P001169 P001170 P001171 P001172 P001173 P001174 P001175 P001176 P001177 P001178 P001179 P001180 P001181 P001182 P001183 P001184 P001185 P001186 P001187 P001188 P001189 P001190 P001191 P001192 P001193 P001194 P001195 P001196 P001197 P001198 P001199 P001200 P001201 P001202 P001203 P001204 P001205 P001206 P001207 P001208 P001209 P001210 P001211 P001212 P001213 P001214 P001215 P001216 P001217 P001218 P001219 P001220 P001221 P001222 P001223 P001224 P001225 P001226 P001227 P001228 P001229 P001230 P001231 P001232 P001233 P001234 P001235 P001236 P001237 P001238 P001239 P001240 P001241 P001242 P001243 P001244 P001245 P001246 P001247 P001248 P001249 P001250 P001251 P001252 P001253 P001254 P001255 P001256 P001257 P001258 P001259 P001260 P001261 P001262 P001263 P001264 P001265 P001266 P001267 P001268 P001269 P001270 P001271 P001272 P001273 P001274 P001275 P001276 P001277 P001278 P001279 P001280 P001281 P001282 P001283 P001284 P001285 P001286 P001287 P001288 P001289 P001290 P001291 P001292 P001293 P001294 P001295 P001296 P001297 P001298 P001299 P001300 P001301 P001302 P001303 P001304 P001305 P001306 P001307 P001308 P001309 P001310 P001311 P001312 P001313 P001314 P001315 P001316 P001317 P001318 P001319 P001320 P001321 P001322 P001323 P001324 P001325 P001326 P001327 P001328 P001329 P001330 P001331 P001332 P001333 P001334 P001335 P001336 P001337 P001338 P001339 P001340 P001341 P001342 P001343 P001344 P001345 P001346 P001347 P001348 P001349 P001350 P001351 P001352 P001353 P001354 P001355 P001356 P001357 P001358 P001359 P001360 P001361 P001362 P001363 P001364 P001365 P001366 P001367 P001368 P001369 P001370 P001371 P001372 P001373 P001374 P001375 P001376 P001377 P001378 P001379 P001380 P001381 P001382 P001383 P001384 P001385 P001386 P001387 P001388 P001389 P001390 P001391 P001392 P001393 P001394 P001395 P001396 P001397 P001398 P001399 P001400 P001401 P001402 P001403 P001404 P001405 P001406 P001407 P001408 P001409 P001410 P001411 P001412 P001413 P001414 P001415 P001416 P001417 P001418 P001419 P001420 P001421 P001422 P001423 P001424 P001425 P001426 P001427 P001428 P001429 P001430 P001431 P001432 P001433 P001434 P001435 P001436 P001437 P001438 P001439 P001440 P001441 P001442 P001443 P001444 P001445 P001446 P001447 P001448 P001449 P001450 P001451 P001452 P001453 P001454 P001455 P001456 P001457 P001458 P001459 P001460 P001461 P001462 P001463 P001464 P001465 P001466 P001467 P001468 P001469 P001470 P001471 P001472 P001473 P001474 P001475 P001476 P001477 P001478 P001479 P001480 P001481 P001482 P001483 P001484 P001485 P001486 P001487 P001488 P001489 P001490 P001491 P001492 P001493 P001494 P001495 P001496 P001497 P001498 P001499 P001500 P001501 P001502 P001503 P001504 P001505 P001506 P001507 P001508 P001509 P001510 P001511 P001512 P001513 P001514 P001515 P001516 P001517 P001518 P001519 P001520 P001521 P001522 P001523 P001524 P001525 P001526 P001527 P001528 P001529 P001530 P001531 P001532 P001533 P001534 P001535 P001536 P001537 P001538 P001539 P001540 P001541 P001542 P001543 P001544 P001545 P001546 P001547 P001548 P001549 P001550 P001551 P001552 P001553 P001554 P001555 P001556 P001557 P001558 P001559 P001560 P001561 P001562 P001563 P001564 P001565 P001566 P001567 P001568 P001569 P001570 P001571 P001572 P001573 P001574 P001575 P001576 P001577 P001578 P001579 P001580 P001581 P001582 P001583 P001584 P001585 P001586 P001587 P001588 P001589 P001590 P001591 P001592 P001593 P001594 P001595 P001596 P001597 P001598 P001599 P001600 P001601 P001602 P001603 P001604 P001605 P001606 P001607 P001608 P001609 P001610 P001611 P001612 P001613 P001614 P001615 P001616 P001617 P001618 P001619 P001620 P001621 P001622 P001623 P001624 P001625 P001626 P001627 P001628 P001629 P001630 P001631 P001632 P001633 P001634 P001635 P001636 P001637 P001638 P001639 P001640 P001641 P001642 P001643 P001644 P001645 P001646 P001647 P001648 P001649 P001650 P001651 P001652 P001653 P001654 P001655 P001656 P001657 P001658 P001659 P001660 P001661 P001662 P001663 P001664 P001665 P001666 P001667 P001668 P001669 P001670 P001671 P001672 P001673 P001674 P001675 P001676 P001677 P001678 P001679 P001680 P001681 P001682 P001683 P001684 P001685 P001686 P001687 P001688 P001689 P001690 P001691 P001692 P001693 P001694 P001695 P001696 P001697 P001698 P001699 P001700 P001701 P001702 P001703 P001704 P001705 P001706 P001707 P001708 P001709 P001710 P001711 P001712 P001713 P00171

agents, film formers and binding agents. Flavoring agents contemplated in the present invention include those commonly known in the art such as essential oils, synthetic flavors or mixtures thereof, including but not limited to oils derived from plants and fruits such as citrus oils, fruit essences, peppermint oil, spearmint oil, other mint oils, clove oils, oil of wintergreen, anise, menthol, and the like. The flavoring agents may be added to the coating syrup in an amount such that the coating will contain from approximately 0.1% to about 12% by weight flavoring agent, and in an embodiment, from approximately 2.0% to about 6.0% by weight flavoring agent (based on dry solids).

[0047] Artificial sweeteners contemplated for the use in the coating include, but are not limited to, synthetic substances, saccharin, thaumatin, alitame, saccharin sales, aspartame, sucralose, and acesulfame K. The artificial sweetener may be added to the coating syrup in amount such that the coating will contain from approximately 0.05% to about 1.0% by weight artificial sweetener, and in an embodiment from approximately 0.30% to about 0.60% by weight artificial sweetener.

[0048] Dispersing agents are often added to a syrup that is used to produce the coating for the purpose of whitening and tack reduction. Dispersing agents contemplated by the present invention to be employed in the coating syrup include titanium dioxide, talc, or any other antistick compound. The dispersing agent may be added to the coating syrup in amounts such that the coating will contain approximately 0.1% to about 5.0% and in an embodiment from approximately 1.0% to about 2.0% by weight of the agent.

[0049] The coating can include coloring agents. These agents are typically added directly to the coating syrup in a dye or lake form. Coloring agents contemplated by the present invention include food quality dyes. Film formers likely added to the coating syrup include methylcellulose, gelatins, hydroxpropyl cellulose, hydroxyethyl cellulose, ethyl cellulose, carboxymethyl cellulose, and the like and in combinations thereof. Binding agents may be added either as an initial coating on the chewing gum center or may be added directly into the syrup. Binding agents contemplated by the present invention include gum arabic, aliginate, cellulose's vegetable gums, and the

like.

[0050] In an embodiment, as noted above, the coating is initially present as a liquid syrup. In an embodiment, the syrup contains from approximately 30% to about 85% by weight of the coating ingredients previously described herein, and approximately 15% to about 70% by weight of a solvent such as water. In an embodiment, the hard coating process is carried out in a rotating pan. More sophisticated coaters such as those made by Driam and Dumoulin may also be employed.

[0051] A coating procedure for hard-coated gum products that can be utilized is disclosed in U.S. Patent No. 5,536,511 the disclosure of which is incorporated herein by reference. Modifications can be made to this process to meet the needs of the product being coated.

[0052] Methods and apparatus for making the product of the present invention are disclosed in United States Patent Application Serial No. 09/681,693, entitled "Process and Apparatus for Producing Miniature Gum Ball Centers Using an Underwater Pelletizer," being filed herewith the disclosure of which is incorporated herein by reference.

Examples

[0053] By way of example, and not limitation, examples of the present invention will now be given.

[0054] Table 1 lists gum center compositions having the following formulation:

[t2]

Table 1 (% Wt.)

Ingredient	Example 1	Example 2	Example 3	Example 4	Example 5
Base	70.50	64.90	67.50	72.00	59.00
Talc	18.00	11.75	23.00	16.00	14.00
Atomite	--	15.00	--	--	14.00

Citric Acid	5.00	--	--	4.00	--
Malic Acid	--	--	--	1.00	--
Aspartame	0.75	0.75	1.00	--	1.00
Acesulfame K	0.75	--	0.50	1.00	1.25
Encapsulated Acesulfame K	--	0.75	1.00	1.00	0.75
Menthol	--	1.00	1.00	--	2.00
Cooling Agent	--	0.85	--	1.00	2.00
Flavor	5.00	5.00	6.00	4.00	6.00
<i>Total:</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>

[0055] Table 2 lists coating formulas that can be used to coat the above-identified gum centers.

[t1]

Table 2 (% Wt.)

<i>Ingredient</i>	<i>Example 6</i>	<i>Example 7</i>	<i>Example 8</i>	<i>Example 9</i>	<i>Example 10</i>
Maltitol	85.60	79.75	--	--	--
Xylitol	--	--	81.70	--	82.85
Sorbitol	--	--	--	86.35	--
Gum Arabic	7.00	8.00	--	8.00	8.50
Guar Gum	--	5.00	9.70	--	--
Malic Acid	--	--	--	0.50	1.00
Citric Acid	--	1.25	--	--	2.00
Titanium Dioxide	1.50	1.25	1.00	--	--
Talc	0.45	0.25	0.30	0.50	0.20
Carnauba Wax	0.25	0.15	0.30	0.50	--
Acesulfame K	--	0.35	--	--	0.10

Aspartame	1.00	--	--	0.50	0.25
Encapsulated Aspartame	--	--	--	0.55	0.10
Menthol	0.50	--	1.00	--	--
Cooling Agent	0.20	--	1.00	--	--
Flavor	3.50	4.00	5.00	3.10	4.75
Color	--	--	--	--	0.25
<i>Total:</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>

Experiment No. 1

- [0056] The formulations of Examples 2 and 6 were used to produce miniature coated gumballs. The final pellet product contained 60% by weight coating. These gumballs were tested in blind taste tests. The tests were conducted among gum users for flavor and breath freshening characteristics. Four gumballs were given to the participants for mastication. Overall, 56% of the participants rated the gum product as more breath freshening, and 45% rated the product having a longer lasting flavor as compared to other commercially available coated chewing gum products.
- [0057] Some participants were allowed to "reload" (add gumballs to their mouth as they chewed the initial four pieces). The results showed that 59% said the product was more breath freshening and 47% said the product had longer lasting flavor compared to other gum products.
- [0058] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.